



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,716	06/05/2006	Zoubair Mohammed Cherkaoui	Q94723	8574
23373 7590 11/27/2009 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037				
EXAMINER WU, SHEAN CHIU				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
11/27/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sughrue@sughrue.com  
PPROCESSING@SUGHRUE.COM  
USPTO@SUGHRUE.COM

### Office Action Summary

**Application No.**

10/581,716

**Applicant(s)**

CHERKAQI ET AL.

**Examiner**

Shean C. Wu

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-21 and 24-44 is/are rejected.
- 7) ☒ Claim(s) 2,3,22 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/US)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. To clarify the restriction/election requirement raised by applicants, now, the claims 1-44 are examined for the merit.

***Claim Rejections - 35 USC § 112***

2. Claims 7, 10, 12-18, 24 and 27-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 7 and 10, the word "preferably" under groups C<sup>1-4</sup> is indefinite.

Regarding claims 7, 10, 12-18, 24, 27-35, the phrase "such as" under groups A<sup>1-4</sup> and P render the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

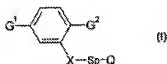
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 21-22 and 24-35 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 0048985 or US 6,676,851.

The reference discloses a novel liquid crystal compound represented by formula

Art Unit: 1795



wherein

$G^1$  and  $G^2$  independently represent a polymerisable mesogenic residue;

X represents a group selected from  $-\text{CH}_2-$ ,  $-\text{O}-$ ,  $-\text{CO}-$ ,  $-\text{COO}-$ ,  $-\text{OOC}-$ ,  $-\text{CONR}^1-$ ,  $-\text{OCOO}-$ ,  $-\text{OCONR}^1-$ ;

Sp represents a group of the formula  $-(\text{CH}_2)_p-$  in which p is an integer of 1 to 18 and in which one or two non adjacent  $-\text{CH}_2-$  groups are optionally replaced by  $-\text{CH}=\text{CH}-$ ; or in which one or two  $-\text{CH}_2-$  groups are optionally replaced by one or two groups selected from the group consisting  $-\text{O}-$ ,  $-\text{CO}-$ ,  $-\text{COO}-$ ,  $-\text{OOC}-$ ,  $-\text{CONR}^1-$ ,  $-\text{OCOO}-$ ,  $-\text{OCONR}^1-$  with the proviso that firstly the spacer group does not contain two adjacent heteroatoms and secondly when X is  $-\text{CH}_2-$ , p can also have a value of 0;

Q represents a polar group selected from  $-\text{CN}$ ,  $-\text{COR}$ ,  $-\text{COOR}$ ,  $-\text{OCOR}$ ,  $-\text{CONR}^1\text{R}$ ,  $-\text{NR}^1\text{COR}$ ,  $-\text{OCOOR}$ ,  $-\text{OCONR}^1\text{R}$ ,  $-\text{NR}^1\text{COOR}$ , F, Cl,  $-\text{CF}_3$ ,  $-\text{OCF}_3$  or  $-\text{OR}$  or a cyclic group which is unsubstituted or optionally substituted by a group selected from a lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy, halogen,  $-\text{CN}$ ,  $-\text{COR}^1$ ,  $-\text{COOR}^1$ ,  $-\text{OCOR}^1$ ,  $-\text{CONR}^1\text{R}^1$ ,  $-\text{NR}^1\text{COR}^1$ ,  $-\text{OCOOR}^1$ ,  $-\text{OCONR}^1\text{R}^1$ ,  $-\text{NR}^1\text{COOR}^1$ ,  $-\text{CF}_3$ , and  $-\text{OCF}_3$ ;

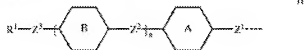
where

R represents hydrogen, a lower alkyl, a lower alkenyl or a cyclic group as defined above; and

$\text{R}^1$  is hydrogen, a lower alkyl or a lower alkenyl group

$\text{R}^2$  represents a lower alkyl or a lower alkenyl group.

Preferably the polymerisable mesogenic residues  $G^1$  and  $G^2$  are each independently represented by the group of formula II



Art Unit: 1795

wherein

A and B are independently selected from the group consisting of 1,4-phenylene, pyridine-2,5-diyl, pyrimidine-2,5-diyl, trans-1,4-cyclohexylene and trans-1,3-dioxane-1,4-diyl; optionally substituted with a halogen,  $-\text{CN}$ , a lower alkyl, lower alkenyl, lower alkoxy or lower alkenyloxy group;

n is 1 or 0,

$Z^1$  and  $Z^2$  are independently selected from the group consisting a single bond,  $-\text{COO}-$ ,  $-\text{OOC}-$ ,  $-\text{CH}_2-\text{CH}_2-$ ,  $-\text{CH}_2\text{O}-$ ,  $-\text{OCH}_2-$ ,  $-\text{CH}=\text{CH}-$ ,  $-\text{C}\equiv\text{C}-$ ,  $-(\text{CH}_2)_4-$ , or  $-(\text{CH}_2)_3\text{O}-$ ;

$Z^3$  represents a group of formula  $-(\text{CH}_2)_p\text{X}-$  in which p is an integer having a value of 1 to 18 and X is defined above, and in which one or two non adjacent  $-\text{CH}_2-$  groups may be optionally replaced by  $-\text{CH}=\text{CH}-$  or in which one or two  $-\text{CH}_2-$  groups may be replaced by one or two additional linking groups X with the proviso that firstly the group  $Z^3$  does not contain two adjacent heteroatoms and secondly when X is  $-\text{CH}_2$ , p can also have a value of 0

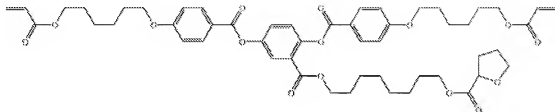
$R^1$  represents a polymerisable group selected from the group consisting of  $\text{CH}_2=\text{C}(\text{Ph})-$ ,  $\text{CH}_2=\text{CW}-$ ,  $\text{COO}-$ ,  $\text{CH}_2=\text{CH}-\text{COO}-\text{Ph}$ ,  $\text{CH}_2=\text{CW}-\text{CO}-\text{NH}-$ ,  $\text{CH}_2=\text{CH}-\text{O}-$ ,  $\text{CH}_2=\text{CH}-\text{OOC}-$ ,  $\text{Ph}-\text{CH}=\text{CH}-$ ,  $\text{CH}_2=\text{CH}-\text{Ph}$ ,  $\text{CH}=\text{CH}-\text{Ph}-\text{O}-$ ,  $\text{R}^2-\text{Ph}-\text{CH}=\text{CH}-\text{COO}-$ ,  $\text{R}^2-\text{OOC}-\text{CH}=\text{CH}-\text{Ph}-\text{O}-$  and 2-W-epoxyethyl in which

W represents H, Cl, Ph or a lower alkyl,

$R^2$  represents a lower alkyl with the proviso that when  $R^2$  is attached to a phenylene group (-Ph-) it may also represent hydrogen or a lower alkoxy.

The reference compound of formula I is compatible with other mesogenic molecular. The reference compound having a low melting point and good alignment properties, which is useful as curable liquid crystals and for preparing liquid crystal films.

The reference compound (shown on page 24 in WO or col. 27 and col. 28 in US '851) below (inherently) anticipates the claimed compound. Also, the first compound on page 19 in WO has melting point  $10^0$  C.



C<sub>10</sub> (N=3)≈27° C.

The reference compound is the same as the present additive No. 6.

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 4-20 and 36-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 0048985 or US 6,676,851 above cited.

The reference teaching has previously set forth in section above. The reference further the polymerizable compounds are useful as curable liquid crystals and for preparing liquid crystal films and **optical** devices (abstract). The reference further discloses that the film comprises the mixture containing a liquid crystal host and at least one chiral and achiral additive (see col. 1, lines 16-34; col. 13, lines 33-50; col. 17, line 64 to col. 18, line 19; and example 7). The reference differs from the present claims in

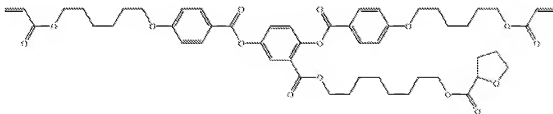
that the claimed mixtures have additives with transition temperature  $40^{\circ}\text{C}$  or lower from liquid crystal state to the isotropic state. The reference compound having transition temperature  $27^{\circ}\text{C}$  is shown above. Although the present mixtures are not exemplified by the reference, it would have been obvious to those skilled in the art to utilize the reference teaching by substituting the compound cited above in the reference example 7 to arrive at the claimed invention.

#### *Allowable Subject Matter*

7. Claims 2-3 and 22-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. The elected species (additive No. 1) is allowed over the prior art.

#### *Response to Arguments*

9. Regarding to claims 21 and 24-35, Applicant's arguments filed 7/24/09 have been fully considered but they are not persuasive. Applicant's attention is directed to the compound of



which reads on the present formula (I) and within the present temperature range.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shean C. Wu whose telephone number is 571-272-1393. The examiner can normally be reached on 10:30 AM to 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kelly Cynthia can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shean C Wu/  
Primary Examiner, Art Unit 1795

scw